Eidgenössische Kommission für Strahlenschutz
Commission fédérale de radioprotection
Commissione federale della radioprotezione
Federal Commission on radiation protection

Workshop 2018

Les relations internationales de la Suisse en Radioprotection
Die internationalen Beziehungen der Schweiz im Strahlenschutz
Switzerland’s international relations in Radiation Protection

Bern, April 13 2018
Opening address of Pascal Strupler, General Director of the FOPH, for the KSR workshop, April 13 2018, on “Switzerland’s international relations in radiation protection”

It is always a great pleasure for me to open the annual workshop of the Federal Commission on radiation protection. The theme for this year’s session – Switzerland’s international relations in Radiation Protection – gives us the opportunity to take stock of Switzerland’s position in the international community.

Switzerland is a small country and we are constantly aware that we cannot remain isolated. This is particularly true in regard to the field of radiation protection, especially for the following two reasons: from its outset, radiation protection has developed as a result of cooperation at the international level; after the end of the first world war it became apparent that means of protection were needed at the international level, not only to ensure the sharing of information but also later in order to confront in a coordinated manner radiological menaces stemming from nuclear tests in the atmosphere;

The increase in knowledge, notably by monitoring populations subjected to exposure, mobilised the commitment of specialists of ionising radiation: epidemiologists, biologists, radiation protection engineers, irrespective of their origin; knowledge sharing has ensured rapid advances in the field.

Even more so than for others, the small country that is Switzerland, cannot navigate alone in the field of research and development in radiation protection. Switzerland is dependent on international
cooperation. The recent revision of our radiation protection legislation is a clear example of this. Both in establishing the principles underlying radiation protection as well as in assessing the perceived levels of risks from the different radionuclides, we have had recourse to the recommendations of the International Commission on Radiological Protection and to the Basic Safety Standards developed by the IAEA and the European Commission. Our work has consisted mainly in adapting these provisions to the local situation in Switzerland.

In order to clarify the international relations of Switzerland in radiation protection, the Federal Commission decided to give the floor today to international organisations and to our closest neighbours. What is your experience with these relations and what do you feel about them? We hope that you will be frank and honest in your analyses! Nevertheless, we are counting on your goodwill to show us how we can improve in the future.

Accordingly, today’s workshop has the aim of initiating discussions in regard to our relations and for us all to reflect together on the formulation of possible improvements. I want to warmly thank the speakers who are certainly going to fuel our reflexion. I thank you all for your interest and contributions to the discussion and wish you all an interesting and fruitful day.
"Recent UNSCEAR statements on health effects from ionising radiation exposure and inferred risks" (P. Jacob)

Recent UNSCEAR statements on health effects of ionizing radiation and inferred risks

Peter Jacob
Representative of Germany at UNSCEAR
Vice-Chair of UNSCEAR

1. United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)

UNSCEAR was established by the General Assembly of the United Nations in 1955. Its mandate to assess and report levels and effects of exposure to ionizing radiation. The General Assembly has designated 27 countries to provide scientists as members of the Committee.

2. Attributing health effects to ionizing radiation exposure and inferring risks

UNSCEAR 2012 Report, Annex A

3. Uncertainties in risk estimates for radiation-induced cancer

ENSCEAR 2012 Report, Annex B

Uncertainties in risk estimates for radiation-induced cancer

- Statistical uncertainties
- Model uncertainties
- Data uncertainties
- Other uncertainties

4. Evaluation of data on thyroid cancer in regions affected by the Chernobyl accident

A 2017 White Paper to guide UNSCEAR’s future work

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5. Effects of radiation exposure of children
UNSCEAR 2013 Report, Annex B

Biological effects
- Compared to adults, children are:
  - more sensitive to chronic effects (cancer, leukemia), thyroid diseases, bone systems, and impairment of the reproductive system
  - more sensitive to febrile neutropenia (leukemia)
  - more sensitive to deterministic effects in lower doses (stochastic)

Radiological and chemical effects depend on chemical form and route of intake.
Chemical toxicity: genotoxic effects, short-term effects
Radiological toxicity: hematopoietic effects (both tissue sarcomas in rats and osteosarcomas in mice), long-term effects

7. Epidemiological studies of cancer risk due to low dose-rate radiation from environmental sources
Adopted at 64th UNSCEAR Meeting in 2017

Technique: Cohort
Dose-dependent increase of leukemia and solid cancer comparable with LSS.
Dose-response for lung cancer and bladder cancer (not observed in other studies)

Epidemiological studies and statistical evaluation of low level radiation:
- No discernible excess was reported for solid cancer or leukemia.
- Law precision of results does not rule out either an absence or a substantially higher effect per unit dose than reported in LSS.

8. Ongoing work
Exposure of patients to scanning radiation
Exposed to scanning radiation
Selected evaluations of health effects and risk inference due to radiation exposure
Biosphere mechanisms influencing health effects from background radiation exposure
Risk from exposure to radon and its penetrating radiation

The German delegation at UNSCEAR is looking forward to a further collaboration with experts from Switzerland

9. Scientific priorities of UNSCEAR beyond the current Programme of Work
Sources and exposure
Mechanisms of radiation actions and biological reactions
Health and environmental effects, and inherited risk
ICRP- Swiss relation in radiation protection

"ICRP and Highlights of our Programme of Work" (C. Clement)

Mission
Advance for the public benefit the science of radiological protection, in particular by providing recommendations and guidance on all aspects of protection against ionizing radiation

ICRP Fundamental Recommendations

Latest
ICRP Publication 103
2007 Recommendations of the International Commission on Radiological Protection

Earlier

Recently Published in the Annals of the ICRP

- P132 Cosmic Radiation in Aviation
- P133 Specific Absorbed Fractions
- P134 Occupational Intakes of Radionuclides: Part 2
- P135 Diagnostic Reference Levels in Medical Imaging
- P136 Dose Coefficients for Non-human Bole Environmentally Exposed to Radiation
- P137 Occupational Intakes of Radionuclides: Part 3
- P138 Ethical Foundations of the System of Radiological Protection
- P139 Occupational Radiological Protection in Interventional Procedures

Primary Aim
Contribute to an appropriate level of protection for people and the environment against the detrimental effects of radiation exposure without unduly limiting the desirable human actions that may be associated with such exposure

ICRP Independent, international community of experts in radiological protection

- 250 experts in science, policy, and practice from more than 30 countries

Structure

Main Commission
Scientific Secretariat

Committee 1: Efficacy
Committee 2: Doses
Committee 3: Medical
Committee 4: Application

Task Groups
Membership

256 members from 35 countries

ICRP Members in Switzerland

Francois Bochud
Institut de radiophysique
Centre hospitalier universitaire Vaudois

Member of ICRP Committee 4 on Application of the Commission’s Recommendations

Member of ICRP Task Group 79 on The Use of Effective Dose as a Risk Related Radiological Protection Quantity (under ICRP Committee 2)

ICRP Members in Switzerland

Marcel Lips
Goesgen Nuclear Power Plant

Member of ICRP Task Group 103 on Update of ICRP Publications 109 and 111 (under ICRP Committee 4)

ICRP Members in Switzerland

Linda Walsh
University of Zurich

Member of ICRP Task Group 91 on Radiation Risk Inference at Low-dose and Low-dose Rate Exposure for Radiological Protection Purposes (under ICRP Committee 1)

Formal Relations

Also in Switzerland

Shengli Niu
Liaison organisation primary contact for the International Labour Organisation

Maria del Rosario Perez
Liaison organisation primary contact for the World Health Organisation

ICRP

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Swiss Academy of Sciences
Confederation suisse
Confédération Suisse
Swiss Confederation

Federal Department of Home Affairs FDHA
Federal Office of Public Health FOH

ICRP

Priorities

Low or no cost publications: first 60 years, ICRP Publication 103, and a few others free to access

Biennial symposia

Liaison organisations

Open nominations for membership

ICRP Code of Ethics

Significant increase in use of social media

Recommending areas of research

Strategic Achievements

FREE STUFF!

The first 60 years of ICRP publications are now available for free download at www.icrp.org

The 1926 Recommendations to Publication 53

Selected newer titles are also available for free download

Publication 167 the 2007 Recommendations of ICRP

Publication 111 Application of the Commission’s Recommendations to the Protection of People Living in Long-term Contaminated Areas after a Nuclear Accident or a Radiation Emergency

Publication 119 Compendium of Dose Coefficients based on ICRP Publication 96

Various proceedings issues

FREE THE ANNALS

Celebrate ICRP’s 90th year by making access to the Annals of the ICRP free*

https://tinyurl.com/ICRPFTA

Cornerstone contributions of €500k already received from UAE FANR & US DOE towards the goal of €500k in 2018*

30% achieved through organisations and individuals

* Achieving the goal will enable all ICRP publications (except the most recent rolling two years) to be freely downoad for everyone, everywhere

Contact: balwy-cloutier@icrp.org or sci-seo@icrp.org

Integrating Protection of People and the Environment

An integrated view of all benefits and impacts includes consideration of protection of people and the environment

To achieve this consistently, the ICRP Committee structure now includes both in each Committee

Oversight: TG 104 Integration of Protection of People and of the Environment in the System of Radiological Protection
Radiation Effects

considers the effects of radiation action from the subcellular to population and ecosystem levels, including the induction of cancer, heritable and other diseases, impairment of tissue/organ function and developmental defects, and assesses implications for protection of people and the environment.

Programme of Work

TG 64 Cancer Risk from Alpha Emitters (Tirnapche)
TG 72 RBE and Reference Animals and Plants (Higley)
TG 91 Radiation Risk Inference at Low-dose and Low-dose Rate Exposure (Rühm)
TG 99 (w/C4) Reference Animals and Plants Monographs (Garnier-Laplace)
TG 102 Detriment Calculation Methodology (Ban)

Members

Chair Werner Rühm (Germany)
Vice-Chair Andreas Wojcik (Germany)
Secretary Jacqueline Garnier-Laplace (France)
Tamara Azuma (Russia)

Doses from Radiation Exposure

develops dosimetric methodology for the assessment of internal and external radiation exposures, including reference biokinetic and dosimetric models, reference data, and dose coefficients, for use in the protection of people and the environment.

Programme of Work

TGs 90, 95 & 96 Dose Coefficients for Workers and the Public (TG 90 Petoussi-Herrns, TG 95 Paquet, TG 96 Bolch)
TG 79 The Use of Effective Dose (Harrison)
TG 103 Mesh-type Reference Computational Phantoms (Kim)

Members

Chair John Harrison (UK)
Vice-Chair Françoise Paquet (France)
Secretary Finlay Butcher (UK)
Alexander Banowski (Germany)
Vladymir Berlinskyy (Ukraine)
Eric Berthod (France)
Augusto Boesem (Germany)
Derek Wakshlag (USA)
Chae-Hyung Kim (Korea)
Rich Leggett (USA)
Jiwei Li (China)
Mario Antonio Lopez (Spain)

Radiological Protection in Medicine

addresses protection of persons and unborn children when ionising radiation is used in medical diagnosis, therapy, and biomedical research, as well as protection in veterinary medicine.

Members

Chair Kimberly Applegate (USA)
Vice-Chair Colin Martin (UK)
Secretary Reza Tadjari (USA)
Jamil Saberi Ardakani (Iran)
Ludovic Van Bladel (Belgium)
Michel Bourguignon (France)
Maria-Claire Centrone (Ita)
Sandro Dementi (Canada)
Masato Hosono (Japan)

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Programme of Work

TG 36 (w/C2) Radiopharmaceutical Doses (Nosske)
TG 89 Occupational RP in Brachytherapy (Dauer)
TG 101 RP in Radiopharmaceutical Therapy (Yonekura)
Justification in Medical Imaging (Åhlström Riklund)

Members

Michael Boyd (USA)
Nicole Mattei (USA)

Anders Carlsson (Sweden)
Anders Carlsson (Sweden)

Thierry Schneider (France)
Sergey Zhidkov (Russia)

John Teale (Canada)

Programme of Work

- TG 76 NORM (Lecomte)
- TG 93 Update on Emergency & Post-Accident Recovery (Kai)
- TG 97 Surface and Near Surface Disposal (Pather)
- TG 98 Contaminated Sites (Boyd)
- TG 105 Considering the Environment (Coplestone)
- TG 106 Mobile High ActivitySources (Cool)

Upcoming Public Consultation

- Effective Dose as a Risk-related Radiological Protection Quantity
- NORM
- Paediatric Reference Computational Phantoms
- Age-dependent Dose Coefficients for External Exposures to Environmental Sources
- Therapy with Radiopharmaceuticals

ICRP - ICRU
90th Anniversary Symposium

Stockholm
October 17-18, 2018
Hosted by
Strålsäkerhetsmyndigheten
IAEA- Swiss relation in radiation protection

"The IAEA project on radioactivity in food and drinking water" (T. Colgan)

Interactions with Switzerland

Christophe Fabio and Martha
- Hosted regional radon meeting, together with WHO (2010)
- Radon consultant in Bulgaria, Estonia, Iran, Serbia and South Africa
- Development of radon safety guide BS63-32
- Development of radon training material
- Hosted radon group from Montenegro

Food and Drinking Water

Not just important after a nuclear or radiological emergency............

International Basic Safety Standards

Section 5: Existing Exposure Situations

5.22. The regulatory body or other relevant authority shall establish reference levels for radionuclides contained in food traded internationally that could contain radioactive substances as a result of a nuclear or radiation emergency, as published by the Joint FAO/WHO Codex Alimentarius Commission [22]. The regulatory body or other relevant authority shall consider the guideline levels for radionuclides contained in drinking water that have been published by the WHO [24].

IAEA General Conference Resolution

GC(60)/RES/5 - 2016

Section 8 – Radiation Safety and Environmental Protection

79. Requests the Secretariat to cooperate with relevant international organizations in developing a harmonized framework for the context of radioactivity in food and drinking water.

GC(61)/RES/5 – 2017

Section 8 – Radiation Safety and Environmental Protection

79. Requests the Secretariat to develop principles for harmonized guidance on radionuclide activity concentration values in food and drinking water, in continued cooperation with relevant international organizations and national authorities.
International Guidance - Summary

Comparison of Guidance - Food & DW

Steering Group

Per Strand, Norway (Chair)
Analia Carcoba, Argentina
Fei Tian, China
Karla Patriva, Czech Republic
Dmitri Konovanok, Russian Federation
John Puki, South Africa
Michael Nolka, United States
Secretariat: FAO, IAEA and WHO

Starting Point for the Project

Issues for Consideration

First steps

Identify distribution of doses based on national and regional data – use GEMS database and UN/CECIA data
Action: IAEA and WHO

Review and compile the available scientific literature published since 2000 on the concentrations of natural radionuclides in foods
Action: IAEA (coordination with FAO, UN/CECIA and WHO)

Source data on natural radionuclides in farmed fish through (1) request for information from participants in the IAEA’s network of laboratories (ALMEVA), and (2) bilateral contacts with producing countries
Action: IAEA
WHO-Swiss relation in radiation protection

"Radiation protection: the public health perspective" (E. van Deventer)

The World Health Organization

- Established on 7 April 1948
- Function: act as the UN directing and coordinating authority on international health work
- Objective: attainment by all peoples of the highest possible level of health

WHO's core functions

1. Articulate ethical and evidence-based policy positions
2. Setting norms and standards, and promoting and monitoring their implementation
3. Shaping the research agenda, and stimulating the generation, translation and dissemination of valuable knowledge
4. Providing technical support, catalysing change and developing sustainable institutional capacity
5. Monitoring the health situation and assessing health trends
6. Providing leadership on matters critical to health and engaging in partnerships where joint action is needed

New leadership at WHO (July 2017)

Dr Tedros Adhanom Ghebreyesus

Priorities

- Climate, environmental change
- Sustainably

Sustainable Development Goals

17 goals to transform our world

The case for change

- 1 billion people made safer
- 1 billion lives improved
- "Our goal is clear - to make WHO a modern organization that works unceasingly to make a measurable difference in people's health at country level" - Dr Tedros

Address to the Executive Board, January 2018
NGOs in official relations with WHO relevant to radiation protection

- International Commission on Radiological Protection (ICRP)
- International Commission on Non-Ionizing Radiation Protection (ICNIRP)
- World Federation for Ultrasound in Medicine and Biology (WFUMB)
- International Commission on Occupational Health (ICOH)
- International Organization for Medical Physics (IOMP)
- World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians (WONCA), in short the “World Organization of Family Doctors”

WHO Collaborating Centres

- A WHO collaborating centre (CC) is an institution designated by the Director-General to form part of an international collaborative network carrying out activities in support of the Organization’s programme at all levels
- Such designation follows a formal procedure within WHO, with specified terms of reference and annual reporting of joint activities
- The Swiss FOPH has been a CC since March 2014, and has just been redesignated for 4 years
Ionizing Radiation

Existing exposures
Radon, a contributor to indoor pollution

WHO Global Initiative on Radiation Safety in Health Care Settings
Diagnostic radiology
Interventional radiology
Radiotherapy
Nuclear Medicine

To promote safe and appropriate use of radiation in health care

Individual Health Assessment of asymptomatic people
Project on justification of imaging asymptomatic people
- WHO is developing a framework for justification and clinical governance of imaging asymptomatic people for IHA
- WHO is revising updating the generic criteria for cancer screening
- This theme will be presented at the 8th International Conference on Preventing Overdiagnosis (Copenhagen, Denmark, 20-22 August 2018), co-sponsored by WHO.

Existing exposures
Radon

Radioactivity in food and water

Radiation exposure in medicine
The Bonn Call for Action
10 actions to improve radiation protection in medicine in the decade 2012-22

Radiation safety culture in health care
- WHO-IDMP-IRPA-IAEA collaboration
- Stakeholders' feedback collected in 5 different regions (during 2015-2017).
  - Workshops held in Latin America, Europe, Africa, Middle East, and Asia
  - Swiss FOPH contributed to the workshop on RSCHC for European countries (Geneva, Dec. 2015)
Radiation risk communication and benefit-risk dialogue in health care

Dissemination of the WHO document on radiation risk communication
- Session on radiation risk communication in paediatric imaging in collaboration with the European Society of Paediatric Radiology (ESPR) at the 53rd Annual Meeting of the ESPR, Davos, Switzerland, 1-3 June 2017.
- 500 copies of the WHO document were reprinted with the support of the Swiss FOPH

WHO’s role in radiation emergency response

International Health Regulations: DHR (2005)
- Provide a legal basis
- Represent a complementary notification to the Emergency Conventions
- Mechanisms and tools for assessment, monitoring, and assistance to strengthen preparedness and response capacity of Member States

WHO’s Radiation Emergency Networks

WHO REMPAN network (1987)
- Radiation Emergency Medical Preparedness and Assistance Network (REMPAN), 40+ centers worldwide
  https://www.who.int/working-radiation-emergency
- 16 Collaborating Centres, 32 liaison institutions, and more than 30 individual experts as observers

WHO BioDoseNet (2007)
- Global network of 60+ dosimetry laboratories
  http://www.who.int/working-radiation-emergency/biodosenet/en/

Risk communication (under development)

Emergency preparedness and response: An “all hazards” approach

Infectious Hazard Management
- High Threat Pathogen Detection
- Diagnostics, treatments, vaccines & other measures

All-Hazards Preparedness/BiH, Risk Assessment & Response
- Conflict
- Nuclear incidents
- Infectious outbreaks
- Chemical incidents
- EVENT CATEGORIZATION
- OCCURRENCE

WHO Radiation Emergency Preparedness and Response

Preparedness
- 1st REMPAN meeting in July 2017 that marked 30th anniversary of the network
- WHO guidelines on iodine thyroid blocking (2017)
- FOPH participated in Joint-Emergency Evaluation mission to Belgium in 2017

Response
- WHO health risk assessment after Fukushima accident (2013)

Radiation Basic Safety Standards

- The International Radiation Basic Safety Standards (BSS) are the global benchmark on radiation safety requirements
- BSS cosponsoring organizations are cooperating to foster its implementation worldwide
- EU countries are transposing/implementing the COUNCIL DIRECTIVE 2013/59/EURATOM: this provides an opportunity for collaboration
- European countries may become “champions” for other parts of the world through their experience in implementing radiation safety standards
Non-Ionizing radiation

Electromagnetic radiation spectrum

Acoustic spectrum

WHO International EMF Project
- Established in 1996
- Coordinated by WHO HQ
- Membership
  - Open to any WHO Member State government department or representatives of national institutions concerned with radiation protection
  - Over 80 national authorities are currently involved in the Project

Electromagnetic fields
Health risk assessments

The InterSun Project
Mission
- To reduce the global burden of disease resulting from exposure to UV radiation
Objectives
- To assess and monitor the health impact of UV exposure
- To provide guidance to national authorities to reduce UV-induced health risks

UV: An environmental risk !!

Sunbed policies

The World Health Organization

"Health is a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity"
French-Swiss relation in radiation protection
"Research for Radioprotection" (J.-C. Niel IRSN)

Identity
- A public body placed under the joint authority of the Ministries of Environment, Defense, Energy, Research, and Health
- National public expert for research and technical support on radiation protection and nuclear safety risks
- 1800 employees, including more than 1000 specialists: researchers, Ph.D. students, post-docs and engineers
- A budget of €300 million
- Establishments in France, including 3 major sites: Fontenay-aux-Roses, Cadarache and Le Winet

Three main missions
- Research and services of public interest, including public transparency
- Support and technical assistance to the public authorities for civil or defense-related activities
- Contractual assessment, study and measurement services for public and private organizations, both French and foreign
- National, European and International collaborations in research and expertise

Why is research for radioprotection still needed?
Although the radioprotection system has shown its efficiency, research for radioprotection is still needed to:
- Reduce uncertainties and knowledge gaps (radiobiology, radiocology, dosimetry...)
- Educate and train new generations of experts and researchers
- Bring answers to societal concerns (for example, low doses issues)
- Address remaining complex challenges (multi-stressors exposures, epigenetics issues, medical exposures...)

Outline
- IRSN in a nutshell
- Why is research for radioprotection needed?
- What is needed to address RP research challenges?
- European landscape
- Role of research platforms in Europe
- Main achievements of EURATOM integration policy
- Conclusions

Fields of Activity
- Nuclear safety: reactors, fuel cycle, waste, medical applications and transports
- Protection of workers, population and environment against ionizing radiation risks
- Emergency preparedness and post-accident operational support
- Training and Education
- Information and interaction with stakeholders and civil society

Research for expertise
- 40% of the budget
- Research strategy
  - 9 Guidelines used to address priority scientific issues
  - 7 questions to radioprotection
  - 10 questions to nuclear safety
- Scientific governance
  - Scientific committee (scientific relevance)
  - Visit committee (quality of research)
  - Stakeholders committee (answer to societal issues)

What is needed to address these goals?
- Radiation protection research is multidisciplinary in nature and has to address complex issues related to a wide range of exposure situations
- Therefore, to address these goals in avoiding dispersion of effort, it requires:
  - An effort in the integration of elementary disciplines, and a high level collaborative approach at the European level
  - A shared scientific strategy at the European level
  - A pooling of resources regarding infrastructures and education & training issues
Triggers of research activities for radioprotection

Research underpinned by strong societal issues aimed at improving the radiation protection of humans and the environment for a variety of exposure situations:

- Chronic exposure to very low to moderate levels of exposure, representative of the variety of situations of environmental exposure to radioactive substances: life in radio-contaminated territories, chronic exposure to multiple streams of populations over several generations, workers-exposure (e.g., HEPs), poliated sites and sites, radioactive waste storage sites.

- Exposure related to increased use of ionizing radiation in medicine: cases of patients exposed to ionizing radiation for diagnostic and / or therapeutic purposes (conventional radiology, interventional radiology, nuclear medicine, external and internal radiotherapy; side effects of radiotherapy).

- Accidental exposure (e.g., irradiated or accidentally contaminated persons).

The role of research platforms in Europe

The purpose of the research platforms is to integrate national and European activities research for their respective field, to define priority scientific goals and to facilitate effective implementation of research.

They have all produced a Strategic Research Agenda (SRA) that identifies these priority goals and the specific resources, infrastructures and training capabilities needed to further develop research.

They are now recognized as the providers of the reference documents by the European Commission (EURATOM) for elaboration of dedicated calls and selection of the associated Financing Instruments.

Such European instruments are of different types:

- Networks of Excellence (NoE), Collaborative Projects (CP), Coordination Action (CA).
- EURATOM-H2020: a European Joint Program (EPJ), to which Europe delegates the governance of calls for projects to the selected CP consortium.

RD&D challenges selected in the joint road map

A. Understanding radiation related to human health effects
B. Improving the concept of effective dose and other quantities
C. Studying the biological and ecological effects on biota
D. Optimizing radiation protection in medical applications of ionizing radiation
E. Improving radiation protection for workers
F. Integrating and optimizing environmental exposure assessment for ionizing radiation and other stressors
G. Optimizing emergency and recovery preparedness and response
H. Enhancing integration of radiation protection science with society

The European landscape

At the European level, the research landscape is articulated into thematic research platforms. These platforms are associative-type structures. They are easily accessible for all entities whose activities fall within the main theme of the platform. They are permanent.

Main achievements of the EURATOM integration policy in the FP fields

Platforms succeeded in gathering scientific communities across disciplines
Shared and available Strategic Research Agendas at the European level
Strengthening of the scientific cooperation with the inclusion of academic partners
Development of policies and action plans for infrastructures and training's education
A “joint road map” under development that will provide:
- A link between societal concerns with RP exposure and science
- A medium term, consensus-based, research strategy to credibly achieve the priorities set in SRA's
- Elements of justification for a medium term funding system for radioprotection research at the European level

Conclusions

Although the radioprotection system appears to be robust, research for radioprotection is still needed as complex challenges remain.

To address these challenges, pooling of resources and shared scientific strategy at the European level are needed.

Integration policy pursued in the EURATOM framework has allowed significant progresses in the RP field (platform establishment, SRA’s, policies for infrastructures and EBT).

A “joint road map” is under development.

If progress has been made in the integration at the European level, progress requires sustained research efforts and policies that will give science maximum chance to solve complex issues in Europe and worldwide.
German-Swiss relation in radiation protection

"Radiation Protection - Scientific Advice for Policy Making in Modern Society" (I. Paulini, BfS)
BfS Research Program

1. Is there a causation between low-frequency magnetic fields and neurodegenerative diseases?
2. Is there a causation between low-frequency magnetic fields and Leukemia in children?
3. Is there a causation between low-frequency magnetic fields and the risk of miscarriage?
4. Is there a co-carcinogenicity of exposure to magnetic fields?
5. How can we define perception and effect thresholds?
6. What do we know about the occurrence, propagation, and absorption of coronal ions?
7. How much do we know of the Exposure of the general public?
8. How are risks perceived and how can we communicate efficiently?
HERCA-Swiss relation in medical radiation protection

"Justification in medicine" (S. Ebdon-Jackson, PHE, UK)

HERCA is a voluntary Association

- It is a voluntary association in which the heads of the Radiation Protection Authorities work together in order to identify and discuss common interests in significant regulatory issues.

Genesis of HERCA WGMA

- Born out of Stakeholder Group
- Philipp Trueb (first chair) established stakeholder engagement as a key principle of HERCA activities
- Work on CT with manufacturers was instigated in Bonn (February 2010) under his leadership
- CT Manufacturers Stakeholder Involvement (see report November 2017) has been a major achievement of HERCA WGMA and formed the basis for extensive professional body liaison

Swiss involvement in HERCA WGMA

- Transposition of Euratom BSSD (HERCA Action Plan 2014)
- Implementation of Euratom BSSD
  - Inspections in operating theatres in Switzerland
  - WP clinical audit
  - WP nuclear medicine

Activities of HERCA WGMA - Justification

- Individual Justification
  - Position Paper on Screening (31 May 2012)
  - Position Paper on Individual Medical Exposures for Diagnosis (3 July 2014)
- Generic Justification
  - Position Paper on New Types or Classes of Practices in the Medical Field (20 November 2017)

Screening Position Paper on Screening (31 May 2012)

- Responded to a need for clarification on
  1. Screening as part of a Programme
  2. Opportunistic screening or individual health assessment (IHA)
- Identified requirements for individual health assessment
- Discussed the impact of both on radiation protection authorities in Europe
Screening

Screening programmes have to be

• evidence based
• meet stringent quality requirements
• approved by the competent national health authorities

Screening

Individual health assessment requires that

• consensus guidelines are developed
• a well-established screening algorithm is followed
• risk profiles of participants are clearly defined
• comprehensive information is provided to participants
• comprehensive quality assurance requirements are adhered to
• training and education programmes are in place
• documentation and evaluation measures are initiated

Individual Justification

The principle is well-understood but in practice is carried out badly

• 1990 RCR/NRPB paper suggested 20% of diagnostic procedures were clinically unhelpful
• 2000 - subsequent papers and reports suggest figure may range between 5% and 50%
• roles and responsibilities are being challenged by the introduction of clinical decision support (CDS) systems

Individual Justification

The Justification Process includes roles for the undertaking and professionals

• sequential and parallel events may take place from presentation to imaging procedure
• responsibilities should be given to those best placed to carry them out (by knowledge and availability in the healthcare pathway)
• the process should be described and subject to QA, inspection, peer review and audit

Individual Justification

Position Paper on Justification of Individual Medical Exposures in Diagnosis (16 July 2014)

• discussed the general concept
• identified elements of the justification process and associated responsibilities
• considered aids to the justification process
• identified a role for the regulator

Individual Justification

When considering the Justification Process

• benefit should outweigh the potential detriment
• patient’s characteristics should be considered
• responsibilities should be clear and appropriate to the investigation and process
• justification should be carried out prior to the examination and processes should be realistic
• tasks may be delegated, responsibility cannot be
Individual Justification
To assist the Justification Process

- referral guidelines are required, should be used but their availability (and inclusion within CDS systems) should not overrule established responsibilities
- education and training will vary but is essential
- audit of effectiveness of the justification process can provide valuable information
- inspection may focus on compliance rather than enforcement but inspection of the justification process is practical in all Member States

Generic Justification
Justification of New Types or Classes of Practices in the Medical Field (20 November 2017)

- topic is difficult and neglected in medicine
- provided an introduction to Euratom BSSD requirements and inclusion of the topic in the HERCA Action Plan
- established HERCA's Position
- included a Report of a Multi-stakeholder Workshop (24-26 October 2018, France)

Generic Justification
To address New Types or Classes of Practices in the Medical Field

- the competent authority may have to undertake proactive and reactive processes
- decisions on justification may be supported by an expert panel
- stakeholder involvement (case by case basis)
- existing assessments (e.g. HTA)
- CE marking
- processes should be practical and timely – the degree of granularity plays a part and there is no common approach to this across Europe

Summary

HERCA WGM has used the development of its position papers on justification in practical ways as part of:

- multi-stakeholder workshops
- inspector workshops
- an inspection week focusing on justification of exposures
- promotion of common understanding of justification - through publications, - through international meetings

Follow-up work

- inspection week - autumn 2016
- paper for International Conference on Radiation Protection in Medicine – December 2017, Vienna

For New Types or Classes of Practices in the Medical Field, the paper

- addressed ICRP principles and its 3 levels for justification
- considered the relative importance of these for medical exposures
- discussed requirements of BSSD 2013/59/Euratom
- reflected on the relationship with Medical Devices Regulation

Summary
Justification is the first, and for many, the most important radiation protection principle in medicine

HERCA WGM has addressed justification in a comprehensive manner from the perspective of the regulator:

- addressing an emerging category of individual medical exposure (IHA)
- discussing individual justification in terms of process (responsibilities)
- identifying key issues for generic justification

Thank you for your attention

For further information see www.herca.org
HERCA- Swiss relation in radiation protection

"New Czech legislation after transposition of EU directive 59/2013 and selected actual problems" (K. Petrova)

Background

Despite common European Regulatory Framework, the flexibility in transposing into national regulations has led to differences in radiation protection practices throughout Europe:

- Need for a network association to exchange on regulatory radiation protection issues
- Recognition of the need for increased co-operation between Radiation Protection Authorities within Europe
- Need for a common understanding, mutual approach and harmonization at the practical level.

Structure & Functioning

- Board
  - Management Level
  - Technical Secretariat
- Chairmanship
- Working Groups (WG)
  - Emergency
  - Medical Applications
  - Veterinary Applications
  - Research & Industrial Sources & Processes
  - Radiation & Training
  - Natural Radiation Sources
- Networks (N)
  - Core Partners/Collaborators
  - Collective medical classes
  - Task Forces (TF)
  - Workshops (WS)

BSS Directive: supporting transposition

- Acting as a platform: identify and discuss practical and technical regulatory issues, to exchange on national approaches and to inform about any studies relating to the implementation of the BSS
- Exploring a common understanding of the new requirements and common approaches including guidance when appropriate and feasible
- Informing the transposition process by sharing regulatory experience and being a resource for Competent Authorities
- Interacting with EC to ensure that European RP Authorities voice is heard in the development of any RP Advisory Group in relation to the BSS
- Adding significant value to the transposition and implementation of the BSS by focusing on areas with relevance for trans-boundary processes.

HERCA Workshops / MSM organised

<table>
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<tr>
<th>Topic</th>
<th>Date</th>
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<tbody>
<tr>
<td>MSM on justification</td>
<td>26 Sept 2014</td>
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<tr>
<td>Joint MSM on CT optimization and justification in medical field</td>
<td>10 March 2014</td>
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<tr>
<td>3rd MSM on CT optimisation</td>
<td>3 March 2017</td>
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<tr>
<td>WS &quot;New improved justification and optimisation in diagnostic radiology&quot;</td>
<td>6-8 Oct 2015</td>
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<tr>
<td>Multi-Stakeholder WS on Genomic justification in medical field</td>
<td>24-26 Oct 2015</td>
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<tr>
<td>MS WS on reporting of accidental and unintended exposures</td>
<td>26-28 Oct 2018</td>
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<tr>
<td>WS on Implementation of IPE-RP</td>
<td>6-8 July 2015</td>
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<tr>
<td>1st Workshop on radiation: national plans</td>
<td>30 Sept 2014</td>
</tr>
<tr>
<td>2nd Workshop on radiation: national in workplaces</td>
<td>13-14 Oct 2015</td>
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<tr>
<td>Workshop on NORM and building materials</td>
<td>24-26 May 2018</td>
</tr>
<tr>
<td>Workshop on the implementation of HERCA-REMS Approach with wind protection</td>
<td>14-15 June 2016</td>
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Documents issued since mid-2016

- Ration
  - Common understanding of the BSBD Requirements and materials
- NORM & Building materials
  - WS conclusions and common understanding of BSBD requirements
- Veterinary
  - Guidelines on RP E&T of veterinary professionals
- Medical
  - Position paper on accidental and unintended medical exposures
- Medical
  - Report on CT manufacturers stakeholder involvement
- Medical
  - Justification of new types or classes of practices in the medical field
- E&T
  - Implementation of BSE & BPD Requirements of BSBD

Medical Applications

- Inspector competence of authorities: organisation of a workshop focused on the inspection of justification and optimisation in nuclear medicine. Opened to any HERCA member.
- Awareness in medical exposures: Actions to be carried out in 2019 on the justification of medical exposures. Priority first given to referring units and the dissemination of key messages.
- Medical equipment: Interaction with COCR on the standardisation of DAP units and on the information to be provided to undertakings required under Article 70 of the BSBD.
- Clinical audits: To interact with professional organisations to explain differences between clinical audit and inspection.

Natural Radiation Sources

- First meeting in January 2018, with EC participation
- Mandate and action plan to be approved in May 2018
- First orientations give priority to the identification of the consequences of the new radiation dose conversion factors at a national level and to work towards a common approach to implementing the new dose conversion factors
- Interactions with stakeholders highly expected: EC, UNSCEAR, IAEA, WHO, IRPA

Research & Industrial Sources & Practices

- Optimisation and justification of research and industrial sources and practices
  - Industrial radiography: exchanging on IR techniques
  - Security of radioactive sources: exchanging on the assessment security
  - Maintenance of industrial radiography equipment: inspecting maintenance
  - High activity source inventory: comparing practices
  - Ionizing radiation systems for cargo-screening: comparing practices with potential position paper

Other internal documents

- HERCA

Emergency Preparedness

- Supporting the implementation of HERCA-WENRA Approach:
  - Common situation report: difficulties for setting the CSR content, new task for analysing IAEA work and integrating HERCA work
  - Cross-border coordination of protective actions: A common understanding of the remaining norm for harmonisation without addressing dose levels is being discussed

Guidance development: monitoring of people & commodities during nuclear or radiological emergencies, factors affecting the implementation of protective actions

Education & Training

- Country fact sheets for benchmarking national requirements

Veterinary Application

- Education and Training Requirements: Interaction with IAEA for including HERCA outcomes in the "Safety Report on Radiation Protection and Safety in Veterinary Medicine"
- Promoting protection of the veterinary professionals and members of the public during on-site X-ray examinations.
- Project to organize a multi-stakeholder meeting on performing X-ray examinations outside of their own country

Conclusions

- HERCA is a voluntary association of the Radiation Safety Authorities in Europe working together
  - HERCA identifies common significant RP issues and proposes harmonization and/or practical solutions towards a common approach for those issues, whenever possible
  - Successful interactions with major stakeholders and EC to be maintained
  - Along the lines of many activities, HERCA is contributed to the transposition of the EU-BSBD directive
  - HERCA activities are now partially focused on BSBD requirements implementation
Conclusions du secrétaire scientifique de la CPR sur les relations internationales de la Suisse en radioprotection

Comme ceci a été montré lors de cet atelier, la collaboration internationale a fait de grosses contributions à la radioprotection en Suisse (par les organismes internationaux : bases scientifiques (UNSCEAR), principes de radioprotection (CIPR), modalités d’application des principes (AIEA) et perspective de santé publique (OMS). On n’a qu’à se baisser pour ramasser les informations et les expertises dans les documents internationaux.

Prenons comme exemple la nouvelle série de la CIPR sur la dosimétrie des travailleurs : il s’agit d’un travail de Titan, allant de la définition des modèles anatomiques en passant par les modèles biocinétiques du tractus respiratoire et alimentaire, par la compilation des données sur les émissions de radionucléides, par le calcul des fractions absorbées à partir de simulation numérique, etc. Un travail gigantesque pour mettre à disposition du praticien de la radioprotection des coefficients de dose internes, bases indispensables pour assurer une protection des travailleurs. Un petit pays comme la Suisse ne serait pas à même de développer un pareil programme ; cependant les facteurs de dose, que nous avons placés dans notre ordonnance de radioprotection, sont notre pain quotidien de radioprotectionniste.

Il s’agit cependant de renvoyer l’ascenseur :

- Participation à la réflexion au niveau international (plus un honneur qu’un engagement)
- Participation à l’animation de la discussion au niveau international (CIPR) et européen (HERCA)
- Participation aux missions de l’AIEA et de l’OMS (formation et expertise)
- Participation à des projets communs de recherche en épidémiologie, radiobiologie et en radioécologie (IRSN et BfS)
- Subventionnement d’actions lancées par les organismes internationaux

Ne pas rester fixé sur nos seuls problèmes. Accepter de consacrer des périodes à la collaboration internationale. Favoriser les échanges. S’engager dans les actions communes. C’est un devoir moral, pour ne pas dire une question d’éthique.

En conclusion j’aimerais remercier tous les conférenciers de ce jour qui ont mis en lumière les relations des organismes internationaux et des pays voisins avec la Suisse dans le domaine de la radioprotection. Je les remercie pour leur générosité à participer au présent atelier et pour leur bienveillance vis-à-vis de nos sollicitations et de nos demandes de support.

Je remercie aussi tous les collaborateurs des offices et des instituts de Suisse en radioprotection pour leur participation. J’espère que le message de l’importance de la collaboration internationale pour la radioprotection en Suisse aura passé et qu’ils sauront aussi à l’avenir honorer la dette contractée vis-à-vis de la communauté internationale.

Enfin merci au Directeur général de l’OFSP pour son soutien à cette participation internationale indispensable au maintien des compétences de sa division radioprotection.

Pour conclure merci également au Président de la Commission ainsi qu’à tous les membres pour m’avoir permis de mettre l’accent sur les relations internationales de la Suisse en radioprotection à l’occasion de mon dernier séminaire en qualité de secrétaire scientifique.

A toutes et tous bon parcours sur les voies nationales et internationales de radioprotection.
Conclusions du président de la CPR sur les relations internationales de la Suisse en radioprotection

En tant que président de la CPR et membre du comité 4 de la CIPR, je suis bien placé pour réaliser à quel point les organisations internationales sont essentielles à la garantie d'une bonne radioprotection.

La question de savoir si la Suisse serait capable de générer seule les réflexions stratégiques et les informations produites par les organisations internationales ne se pose pas. La réponse serait d'ailleurs également négative pour les plus grands que nous ceux qui pourraient penser qu'il est temps de passer "en premier". En effet, les documents produits par les organisations internationales sont le fruit de collaborations très larges où les compétences et les expériences passent bien avant les origines des contributeurs. C'est bien parce qu'elles sont issues de réflexions basées sur la raison et les besoins de la pratique que les propositions de ces organismes sont généralement reprises dans les législations nationales.

Notre pays a la chance d'avoir des experts reconnus dans le domaine de la radioprotection. La meilleure manière de rendre une partie de ce qui nous a été offert est de suivre les pas de notre secrétaire scientifique et de les encourager à collaborer activement avec les organisations internationales.